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Rainfall Patterns Threatened by Climate Change in Tanzania

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1. Introduction

How Climate Change Disrupts Tanzania's Rainfall Season

Over the past decade, Tanzania's vulnerability level to climate change has impacted agriculture, livestock, human health, water and ecosystems. A UK Aid publication titled, The Economics of Climate Change in Tanzania [2010] noted that aggregate models indicate that climate change could lead to net economic costs, equivalent to a loss of almost 2 percent of GDP each year by 2030 in Tanzania.

Rainfall is now unpredictable in Tanzania as climate change impacts the intensity and frequency of precipitation. Climatically, all year round the weather remains pleasant and comfortable. However, over the past years, the observed trend has depicted how climate change poses a significant threat to rainfall—which is essential for the livelihood of millions.

The Tanzania Meteorological Agency (TMA) argued that the current climate change situation occurring worldwide and in Tanzania had impacted climate systems and seasonal rains (The Citizen). The TMA agency director, Agnes Kijazi, argued that there were recently prolonged periods of dry spells in March, leading to suppressed rainfall, especially in most areas of northern and northeastern highlands. "The prolonged dry spell was caused by several tropical cyclones in the Mozambique channel that occurred further south of the position that could have enhanced rainfall in the country,," The TMA director said.

Further, the TMA director continued to point out that "the sudden changes in Sea surface temperatures (SSTs) emerged over the East African coast and East part of the Indian Ocean. The sudden changes in SSTs rarely occur due to the tendency of oceans to conserve heat for long periods. However, this has been caused by the impacts of Climate Change."

The TMA director argued that the occurrence of Tropical cyclones and changes in SSTs contributed to holding the Intertropical Convergence Zone (ITCZ) over the southern part of the country—which usually commences its movement to the northern parts of the country in early March (The Citizen).

Weather cycles have become responsible for bringing catastrophic events such as drought and floods, causing widespread material and human life. Sadly, Tanzania's agricultural production system is mainly dependent on rainfall and is thus susceptible to variabilities in rainfall and temperature.

Reliefweb, a humanitarian information source, pointed out that the future might be much more threatening unless strict interventions are placed to curb the latter; these scenarios are likely to persist.

As Tanzania's agriculture is based on a rain-fed system, rainfall uncertainty presented significant threats to food security. "This condition is likely to cause below normal-to-normal rains over the

northern coast, northeastern highlands and some areas of Mara, Simiyu and Shinyanga regions. However, normal to above normal rains are expected to continue over the northern part of Kigoma (Kibondo and Kakonko districts), Kagera, Geita and Mwanza regions. It should be noted that events of heavy rains might occur despite suppressed rainfall conditions expected during 2022." The TMA director noted.

2. Rainfall in Tanzania

According to a Switzerland based open access publishing platform, annual and seasonal precipitation trend analyses from 1961 to 2016 show maximum rainfall decline in Tanzania during the long rainy season in the fall (March–May) and an increasing precipitation trend in northwestern Tanzania during the short rainy season in the spring (September – November).

With exception to some areas, the East African nation has a tropical savanna climate influenced by the Indian Ocean. Tanzania, located south of the equator, has a rain pattern throughout the year. The primary rainy season, or the 'long rains,' fails from March till May. The long dry season lasts throughout June, July, August, September and October when rainfall is unusual, even on the islands (Weather and Climate).

Further, during November and December, there's another rainy season, the "short rains", which are much lighter than the main rains and less constant.

A 2021 Reliefweb report argued that a 5–8 percent increase in rainfall is anticipated by 2050, with a projected increase of up to 13 percent in drought and flood-prone areas. "Substantial changes in rainfall are expected in the central and lake zones" Reliefweb report pointed out.

Tropical cyclone changes in SSTs holding the ITCZ over the southern part of Tanzania have led to disruptions in the evolution of climate systems which affected the progress of 2022 rainfall.

However, the TMA pointed out that the rains mentioned this year were expected to cease between the first and second week of May 2022 over the northern coast, while over north-eastern highlands, cessation is expected between the second and third week of May 2022. Also, cessation over the Lake Victoria basin is expected between the third and fourth of May 2022.

3. Climate Action

The first action taken against rainfall disruption is on water, food security and farming systems, as rainfall commands much more comprehensive attention to farming systems across Tanzania. In paddy farms which produce rice, the second most important food and commercial crop after maize, nearly 71 percent of lowland farms are rainfed dependent.

On the bright side, environment and climate experts are working tirelessly to circumnavigate the impacts of climate change with every technology and information at hand.

Recently, 35 United States experts from Northeastern University Boston, Massachusetts and local researchers from Tanzania Agricultural Research Institute (TARI) and TMA, lectures and students in the field learn and exchange knowledge on better ways to mitigate the impacts.

Meanwhile, the government of Tanzania is taking climate action in its way. In 2021 the Deputy Permanent Secretary in the Ministry of Agriculture, Prof Siza Tumbo, stated that the government is working with diverse stakeholders to ensure an adequate quantity of affordable, nutritious food stored for the masses as the first mitigative measure against climate change.

Rainwater harvesting and sustainable use of water resources are two essential mechanisms to create ease when water scarcity hits—when the rain stops. However, the TMA director urged farmers to apply agronomic practices that adhere to climatic smart agriculture, technologies and techniques available and asked for further information from extension officers.

Reference

The Economics of Climate Change in Tanzania, a UKaid publication April, 2010

United Republic of Tanzania (1999), The Tanzania Development Vision 2025, Government of Tanzania, http://www.tanzania.go.tz/vision.htm (Accessed on April 22nd 2022, 13:30)